PROVIDING SUSTAINABLE & EQUITABLE ACCESS TO INFORMATION:

PERSPECTIVES FROM NIGERIA

Festschrift In Honour o

PROFESSOR MORAYO IBIRONKE ATINMO @ 70

'Niran Adetoro
Christopher Nkiko

Published by

Tai Solarin University of Education Press
Ijagun, Ogun State, Nigeria

First Published, 2016

ISBN: 978-978-956-607-5

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DESIGNING GREEN LIBRARIES WITH NEW TECHNOLOGY FOR ENHANCED ACCESS TO INFORMATION

By

Adetoun Adebisi Oyelude

Kenneth Dike Library, University of Ibadan, Nigeria

&

Adeyemi Kazeem Ajayi

Kaunas University of Technology, Kaunas, Lithuania

Abstract

In the world today the idea and conception of designing green libraries with the newest technology is gaining momentum and the drive is for institutions to adopt green library buildings, by greening existing library facilities, embracing environmentally sustainable and supportive practices within the library, and providing green library services with technology. All these eventually aim to provide access to information (ATI) in the best way possible. The notable most important things for making healthy and efficient sustainable libraries are ecology, technology and economy. The main objectives of this paper are to analyze the importance of green libraries; to identify the standards for green libraries with new technology; to identify the significant green library initiatives at various places; to reveal various methods and techniques for greening the library; and to make suggestions for building green libraries with new technologies for sustainable development and growth for enhanced ATI. The paper concludes that librarians have to work on updating themselves on

sustainability and technology trends in the field of librarianship and should lay out awareness raising programmes and also design the space in the libraries with adequate consideration for enhanced access to information that exemplify the green practices with new technologies.

Keywords: Green Library; Green Building; Access to Information (ATI), Sustainable library design; Libraries and New Technology.

Introduction

In recent years, the phenomenon environmental sustainability has become a global concern because of the state of the world's ecosystem. The library is not left out in this because of the vital role it plays in any nation's development, growth and educational system. Therefore, libraries around the world have become one of the most common categories of new construction to embrace sustainable design with new technologies. In attempting to ensure this, a novel concept popularly called greening has evolved. This innovation is happening by designing new green library buildings with the newest technologies, by greening existing library facilities, by embracing environmentally supportive and sustainable practices within the library, and providing green library services.

The notable most important things for making healthy and prosperous sustainable libraries are ecology, technology and economy. That is, the libraries can utilize the use of resources and save money and time and they can keep the relationship between living things and their environment and can also make eco-friendly environment. All these, with the singular aim of providing access to information (ATI) to all categories of library users.

Green library innovations emphasize a new mindset of taking responsibility for the stability of nature, health of library users and staff and catering for the needs and interests of future generations of users. Libraries as non-commercial and service oriented public buildings are particularly suited

to give examples to illustrate the idea of sustainability, to distribute and to disseminate this idea to the people.

We will use the broad definition that "developing a green building is the practice of creating structures and using processes that are environmentally responsible and resource-efficient throughout a building's life-cycle from site selection to design, construction, operation, maintenance, renovation and deconstruction" (www.epa.gov/greenbuilding/pubs/about.htm). This paper is premised in part on the idea by Hauke (2013) that libraries ARE already environmentally friendly because they are engaged in lending of collections, information retrieval, and provision of an open, common space. In addition, some library buildings are energy saving because they sometimes are rectangelcubus with a minimum of outside walls, atrium giving maximum of natural light, provide a re-use of old buildings for library purpose and have Green roofs (for example, the Philological Library, Berlin). Green roofs simply entail constructing the roof in such a way that small plants could be grown on the roof, and solar panels also installed on it, and roof gutters cjanelled to drop or deposit rainwater in tanks or reservoirs to collect water for use. Greening in all contexts, saving money, effort an

Literature review

So far, only few African countries have implemented measures such as labelling or minimum energy efficiency performance standards (MEPS) for the refrigeration and air conditioning equipment. In comparisons, countries and regions like the US, Europe, Japan, Korea, China and India have demonstrated to substantially lower their energy use through the introduction of MEPS and supporting technology programmes. Similar standards are suitable for reducing the leakage of high GWP refrigerants and the use of low GWP refrigerants instead. Leaking HFC substances are very harmful to the environment and require special treatment. Suitable facilities for the destruction of HFC substances are hardly available in Africa.

Except for very few organizations such as Green Cooling Africa Initiative (GCAI) (2014) in some Countries: Ghana, Kenya, Mauritius, Namibia, "some European countries recognize responsible handlings of resources are necessary for the image and future of libraries. For this it is important to educate the public, hold workshops, teach about proper handling of waste, using the new media as well as using rooftop plantings to reduce CO2". Adlrich (2010) maintained the stand that libraries should obtain the services of a "sustainable building advisor" when planning their buildings to ensure that greening standards will be met. For him, the professional touch for putting the green building together is important.

Oyelude and Alabi (2012) in their study on pluses and minuses of greening in libraries found that "Nigerian libraries are implementing "green" measures at minimal level and rather unconsciously. The level of awareness of greening initiatives among Nigerian librarians is still relatively low" however. They recommended that there was a need for "increased awareness and environmental literacy among library users and the entire community to build better green momentum in Nigerian libraries"

For some other scholars, greening in organizations can be achieved through awareness creation. Gaming is one of such means of awareness creation as posited by Awodele, Malasowe and Onuiri (2012) who measured the green footprint in Babcock University, Nigeria and developed a Generic Green IT model for possible adoption. The model was designed to use different ways of ensuring green Information Technology in organizations. A Greening game board designed like the game of Monopoly was proposed to be used for greening awareness.

Sonkkanen (2013) suggested simple daily routines geared towards greening as solution. Laptops were to be preferred to desktops in computer acquisitions, and the habit of turning off computers and other devices at the end of each working day and at weekends could be cultivated. Printers could be set to print on both sides of the sheet by default, and again,

giving preference to electronic channels in communications could be a greening strategy.

Greening as a sustainable development initiative has been practiced in various places globally. In libraries in particular, greening goes on at various levels and with different dimensions depending on the place, the space, the environmental conditions (e,g. the climate of the country, location of the library, and even the culture of the people in the community). Some significant greening initiatives in libraries around the world have been listed by Kumar and Antoo (2014) thus:

Name of Library	Features	Place and Country
Anythink Brighton	Termed the first carbon-positive library in the US	Brighton, USA
Bozeman Public Library	It utilizes green materials that has been recycled, daylight, photovoltaic system, and received LEED silver certification.	Bozeman, USA
Calgary Public Library - Crowfoot Branch	It incorporates daylight and energy harvesting, use recycled materials, and reduces the use of water.	Calgary, Canada
Eden Prairie Library	Known as the first in US to create natural gas fuel cell for power and heat on-site. It boost efficient landscaping, recycled materials, low VOC materials and efficient lighting arrangements.	Eden Prairie, USA
Fayetteville Public Library – Blair Library	Known as the first building in the state of Arkansas to register for LEED certification and features rainwater catch for irrigation, white membrane roof, cork flooring, recycled content furnishings, low VOC finishers and fabrics.	Fayetteville, Arkansas. USA

Kanazawa Umimirai Library	Designed as a spacious and natural light filled environment supported by 6,000 small circular windows	Kanazawa, Japan
National Library of Singapore	Known as the first green library for kids	Singapore
Seattle Public Library – Ballard Branch/ Ballard Carnegie Library	Possesses green roof , conserve rain water, adds solar panels, skylights to use daylight and recycled carpet.	Seattle, Washington. USA
Spanish Peaks Library District	Uses geothermal system for heating and cooling. Flooring made of recycled rubber and recipient of Stephen H Richard award in 2010.	Walsenburg, Colorado. USA

(Source: Adapted from Kumar and Antoo (2014))

These methods used in the libraries ensure that green footprints are left behind. Access to information is also provided in the best way possible using greening standards. For physically challenged library clientele, it is necessary yo provide ramps and lifts or any other equipment that will make physical access to the library very easy. Also, for the visually impaired, proper and adequate lighting using LED lighting would be best, as weoo as provision of Braille materials, computers that are disability friendly and other such to make easy access possible. All the facilities need to be compliant with green standards. A further look in the literature on greening we found revealed that some other green initiatives are as follows:

Table 2

Name of Library	Features	Place and Country
Amsterdam Public Library	Uses a ground source heat system together with highly efficient boilers. It also makes use of free cooling from the cold air outside; uses solar panels, double glazing, and sustainable materials.	Amsterdam, Netherlands
B. Thomas Golisano Library at Roberts Wesleyan College	Temperature regulated through geothermal methods, uses energy derived from wind or biofuels, natural daylight, uses renewable materials.	
Chaudhary Braham Prakash Ayurved Charak Sansthan(Institute) Library	Daylighting and ventilation, power saving by using floor tiles, Gypsum board and fall ceiling, indoor sprinklers, smoke detectors and aluminum glass door installed.	Khera Dabar, New Delhi, India
Daniel Ruiz Public Library,	Uses recycled materials, landscape preserves existing trees and vegetation buffers, solar control, clearstory space in central building for natural illumination.	Austin, Texas

Learning Resource Centre, Catholic University of Eastern Africa Library.	Energy-efficient design, natural ventilation, natural lighting even in its basement, stones absorb ground moisture that creates a cooling effect as it evaporates in basement. Collects and stores rainwater to use within the building. Large windows and doors are protected from the sun's heat by shades.	Nairobi, Kenya
The Todd & Ruth Warren Library at Ashesi University.	Green eco-friendly building design, with roofs that harvest rainwater for storage and use, natural lighting, recycling of trash.	Berekuso, Accra, Ghana.
Kenneth Dike Library, University of Ibadan	Use of natural ventilation through large windows and doors in 70% of the Main Library building. Use of LED light bulbs, recycling of used equipment such as fluorescent bulbs and toner cartridges. Encouraging the use of electronic communication (emails, text messaging) among staff rather than printing always,	

Various technologies for greening the library.

In order to achieve greening of libraries, some of the following materials, energy and waste management procedures could be adopted for library buildings:

- **Energy efficient monitors:** CRT monitors have to be replaced with larger, brighter LCD monitors that use less energy (up to 60% less). The LCD monitors will save lots of kWh. These monitors usually provide the first contact of the library users to the information they need to access.

- **Internal Processes**: Wherever possible, library staff should try to reduce the amount of resources and energy used during daily operations. For instance, library vendors could be mandated to ensure that product catalogues and other correspondence are provided electronically instead of in print. When printing is required, recycled paper, or the back of used copies could be used. Marginally using energy seemingly reduces access to information but in reality, protects the environment and reduces running cost. In terms of cost, access to information is made cheaper.

- **Cloud Computing Technologies**: Libraries should make better use of cloud computing services in order to avoid print materials. Documents, databases and previously stored materials can be called up from the clouds. Cloud computing keeps documents safe and in a location where it can be accessed readily without taking up too much physical space.

- **Use of Green Architects**: Using architects who are Green Library compliant (that is, who know what technologies to use in greening libraries) and are proactive, will ensure that the appropriate technologies are used and provided for in the planning and

execution of green library buildings. Where an old building is to be renovated or made eco-friendly, the green architect must be involved from the onset of the project.

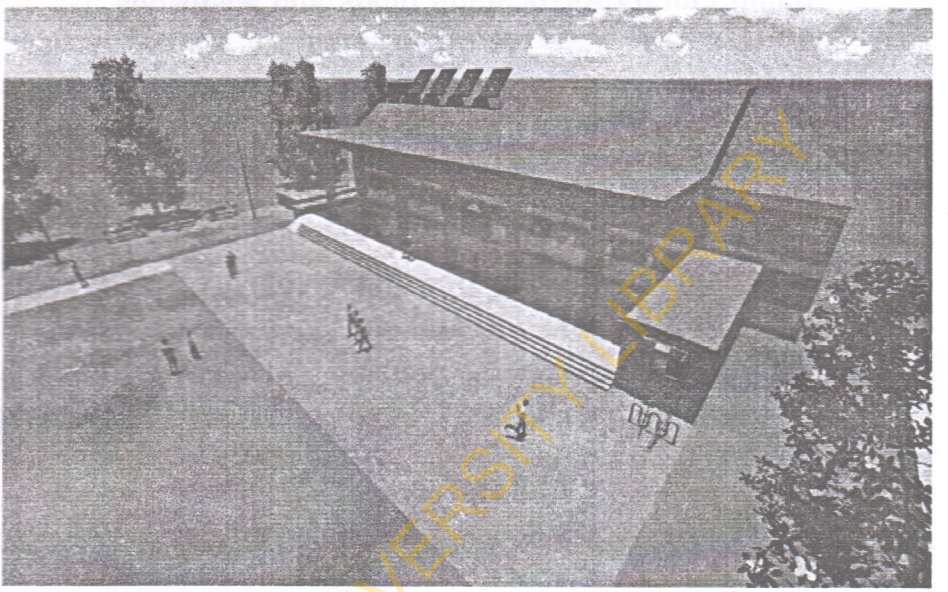

Fig. 2. Model of Green Library building with green roof, LED lighting and good ventilation.

- **Use of recycled materials**: The cost of a green library building could be drastically reduced if recycled materials are used. It is economical to do so. It entails being creative and tapping in to the innovativeness of staff and even users of the library facility. Environmental conditions and occupant behavior have to be considered in doing this and community involvement is also important.

- **Using Social Media to create awareness**: The library should employ any technology to create awareness on the greening efforts of the library. Twitter, Facebook, LinkedIn, Instagram, Youtube,

billboards, newspaper adverts, television jingles etc. to spread the word about the library's green activities. ATI is ensured when such steps are taken.

- **Using Library Association blogs and webpages**: Libraries should not hesitate to use the technologies of Library Associations that have websites and blogs that can promote the green library initiatives they have. Associations at Local, Regional and International level can be leveraged on for this. If libraries do not blow their own trumpet, no one will blow it for them.

Conclusion

In conclusion, librarians and information professionals have to work in collaboration with hordes of other professionals in a collaborative process that ensures the success of their greening initiatives. With the new technologies that are necessary for the work to be done, architects, engineers, environmentalists, landscapers, Information Technology vendors, computer scientists, computer analysts, interior decorators, gardeners and so many other people will have to work on greening library buildings. They remain very important factors in the ATI process, thus it will be necessary for librarians to stay abreast of the new technologies and constantly update themselves on sustainability and technology trends. As conduit pipes for knowledge and information, their role in ATI provision cannot be undermined albeit providing the services in a green environment, with new technologies is an added advantage.

It probably would not be out of place for library schools to design new curricular that will take library buildings as a subject, and the greening of the libraries for environmental sustainability as a component to be taught by library-friendly, ecofriendly architects jointly with economists and library administrators. Library buildings and library design are very crucial, and have impact on access to information, and therefore great attention should be paid to them, for the green practices with new technologies to reflect globally.

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